THE CASE FOR LINGUISTIC SOPHISTICATION IN COMMUNICATION AIDS

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This paper argued that Voice Output Communication Aids (VOCAs) have disadvantages as well as advantages over word or symbol boards. Word boards are more portable, unbreakable, and, most importantly, they are faster than VOCAs for many users. This is because the voice output of word board is the voice of a human interpreter -- the listener -- who speaks the words as they are pointed to. But human interpreters do more -- they provide the proper word endings, and they provide guesses for continuation of what the user is trying to communicate. This interaction can greatly speed up communication, especially for the majority of VOCA users who, now that they have a voice, want that voice to produce complete speech, with suffixes and function words, etc., present. VOCAs, of course, have their advantages. They do not require close personal distance, and thus allow better, interaction with more casual acquaintances. They are less interruptable; they are usable over the telephone; messages can be prepared when the recipient is attending to someone or something else. If VOCA use could be sped up, users would have the best of both worlds.

I claim that VOCAs could be designed to speed up communication, if much more linguistic sophistication is built into them. Bellugi & Fischer (1972) noted that American Sign Language can communicate messages with half as many signs as words. If VOCAs could be programmed to accept sign-language-like input and yet produce English output, the speed of use could double. This would require building in a number of syntactic and semantic features. The remainder of this paper was concerned with presenting some of the features that could, and should, be built into VOCAs in the future.

(1) Function word insertion
want go → want to go
believe they want → believe that they want

(2) Concord insertion
he look sick → he looks sick

(3) High probability words added as a default option
want go → I want to go
they go store → they go to the store
man say → the man says

Other types of linguistic sophistication add speed in more subtle ways. On VOCAs there are always limits on the number of easily accessable vocabulary items. An unsophisticated VOCA may take up many of these valuable slots for linguistically predictable alternate forms.

(4) Subject-verb agreement
they be → they are
he be → he is
man say → man says [/sɛz/]

(5) Correct tense insertion
past fight → fought
past do → did

(6) Correct plural insertion
child plural → children
woman plural → women [/wɪmɪn/]

(7) Correct case
he like she → he likes her

One can also save time by making use of grammatical relationships that go beyond the sentence.

(8) Automatic pronoun insertion
He like she. Go visit much. Often take out. → He likes her. He goes to visit her a lot. He often takes her out.

(9) Long term tense setting
past he like she. Go visit much. → He liked her. He went to visit her a lot.

(10) Register setting
polite want drink → Could I please have a drink?

Other capacities would be useful. While preparing a message, the user often finds that the conversation goes on and that he would like to say something in addition to the remark he is preparing. This could be solved with a self-interruption feature, in which a message could be saved in memory while another message was output. A self-editing feature would also be useful, in which a word other than the last one could be changed.

Another area where linguistic sophistication can help is vocabulary access. As the cost of computer memory drops, it becomes easier to build in hundreds or thousands of additional words. How can one access 5000 words? A display with 80 locations would mean that each location would have to represent, on the average, 62 words. One possible solution involves semantic spelling, in which words are accessed by signalling their semantic components. Such a system could be based on Blissymbolics (Hehner, 1980), which works in this way.

(11) Semantic spelling
hot opposite → cold
feel up → happy
feel up future → hope
do feel up → enjoy
feel down past → regret
feel against → resent

Thus while I claim that VOCAs as currently implemented tend to be too slow, linguistic sophistication can go a long way toward speeding up communication, and in so doing improve the users' ability to cope with their environment.

Bellugi, U. & Fischer, S. 1972. A comparison of sign language and spoken language. Cognition 1, 173-200

Hehner, B. Blissymbols for Use. Toronto: Blissymbolics Communications Institute, 1980.